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## Odontology Section - 2015

### **G21 Chronological Evaluation of Bruising in Bitemarks and Blunt Trauma: Validation of the Validation of the Nuzzolese-Neri-DiVella (NNDV) Colorimetric Scale**

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After attending this presentation, attendees will have an understanding of the standards and accuracy of a new colorimetric scale for the standardization of photographic imaging of bruises and ecchymoses.

This presentation will impact the forensic science community by presenting the results of a new and very useful tool for forensic photographic imaging and chronological assessment of bruising.

One of the more controversial aspects in the evaluation of a wound caused by trauma in a living subject is determining the time in which the trauma was inflicted; this is accomplished by evaluating its age determination according to repeatable standard procedures which are able to be measured, uninfluenced by subjectivity. Observational standardization, combined with a chromatic evaluation of the areas affected by ecchymoses, are necessary in order to obtain such a result.

The goal of this study is to verify the validity of the innovative NNDV colorimetric scale as an aid to the development of a photographic and analytic standard in the field of forensic photography, targeting chronological determination of one or more ecchymosis caused by trauma or human biting. The discriminant factor of the current technique and subjective procedure has been evaluated using the NNDV colorimetric scale, relating to the changing colors of the ecchymosis due to the passing of time by using an innovative color index. A total of 17 subjects and 22 ecchymoses were assessed and rated using this scale. Validation was performed through statistical analysis via software for the analysis of Red/Blue/Green (RBG) colors on the DigitalColor Meter. The RGB percentage value present in different areas of the ecchymosis was assessed and compared to the RGB value present on the color sections of the colorimetric scale located on the same photograph, using the same light exposure. This allowed identification of the two RGB percentage values which were most similar to each other in order to facilitate evaluation of the chromatic variants and validate the deductions obtained during the first stage of the method.

Chronological determination was accomplished by using both the subjective and objective discriminant power of each method. The power increases by combining the objective technique to the validation of the method via the use of a photo-editing software, reaching 86.36% percentage of success.

The colorimetric scale shows promise as a valuable and reliable tool for medical examiners and forensic odontologists for the assessment and standardized interpretation of bitemark and bruising age evaluation through the use of a photo-editing software.

#### **Forensic Photography, Blunt Trauma, Bitemark**